

Pruning and Training Vines

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Pruning is the most important cultural practice in the management of grapevines. In mature vineyards it is done to select fruiting wood, maintain vine shape and form, and regulate the number of buds retained per vine. In new vineyards, pruning is done to establish the vine form. There are two basic types of pruning: cane (long) pruning and spur (short) pruning. These differ only in the length of the fruiting wood that is retained and the training system used to effectively display the fruiting wood.

Grapevines are trained onto the trellis in a variety of ways depending on cultivar, growth habit and vigor. The most efficient training systems provide well spaced, evenly distributed fruiting wood along the trellis and promote full sun exposure for clusters and basal nodes. Popular cane pruned training systems are the Four-arm Kniffen and Umbrella Kniffen systems. Popular spur pruned training systems are Bilateral Cordon and Geneva Double Curtain. Some cultivars perform best when cane pruned rather than spur pruned. This is partly due to their growth habit, but also due to excess shading of basal nodes that result from improper canopy management. Spur pruning systems which include proper shoot positioning have been shown to yield comparably to cane pruning systems for many cultivars. Most French hybrids are well adapted to spur pruning because of their fruitful basal nodes. The choice of systems is also dictated by the amount of labor available, vine vigor, and other factors.

Training Young Vines

Pruning and training of young grapevines is done to establish vine form that meets the requirements of the training system. It is important to establish a large healthy root system during establishment years by promoting maximum amounts of well-exposed foliage. Proper training begins during the year of planting and involves the establishment of strong, straight trunks. After planting, but before bud break, prune the top back to a single shoot with 2 to 5 buds. Some growers leave a short side shoot to tie string(s) for training new shoots to the trellis. String should never be left around the main trunk of the vine or girdling may result. As shoots begin to grow, the most vigorous are selected to become the trunk(s) and the rest are removed. The selection of single or double trunk training systems can be made during the first or second year of growth. If a double trunk system is desired then two shoots can be trained during the first season, or one during the first and another during the second season. During the second season the cordons (on spur pruned systems) or heads (on cane pruned systems) are established.

Fruit production does not normally begin until the 3rd season. It has been shown that cropping young vines can reduce the size of root system and vine vigor. Consequently it is important to remove all flowers and fruit from first and second year vines. Only in the case of excess vigor should any fruit be left during the second season, and then it should be only one or two clusters per plant. Since the first two seasons are used to establish the vine form there is usually more fruiting wood retained than needed and the crop potential will exceed the capacity of the vine to support the fruit load. It is critical to remove this fruit early in the growing season. About one half of a full crop of fruit can be retained during the third season if vine vigor is sufficient. In general, if less than one pound of one-year-old cane growth is removed from a vine at pruning, then all fruit should be removed. Heavy fruiting of young vines will result in small vine size and reduced yields which may take several years to correct. It is best to be patient and fruit vines only after they are well established.

Pruning Mature Vines

Mature grapevines require annual pruning to remain productive and manageable. An average grapevine will have 200 to 300 buds on mature canes capable of producing fruit. If all buds were retained the result would be a large crop that would not ripen properly. Vine vigor would be reduced. Vines would not mature enough to be cold hardy and crop potential for the following season would be reduced. To avoid this situation researchers have developed a method of pruning to balance the fruit productivity and vegetative growth that will give maximum yields without reducing vine vigor or wood maturity. This procedure is referred to as Balanced Pruning. The amount of pruning is based on the vigor of the vine. The term to quantify vigor is vine size, which is determined as the weight of one-year-old cane prunings. To balance prune a grapevine, estimate the vine size and prune the vine, leaving enough extra buds to provide a margin of error. Then weigh the one-year-old cane prunings with a small spring scale and apply the weight to the pruning formula to determine the number of buds to retain per vine. For example, for Concord vines, the pruning formula is $30 + 10$, which means leave 30 buds for the first pound of prunings plus 10 buds for each additional pound. A vine with three pounds of prunings would require a total of 50 buds, 30 for the first pound plus 10 for each additional pound. In a commercial situation, weighing each vine in a vineyard is not practical. A grower can learn to accurately estimate the vine size after a little practice and occasional weighing helps assure the estimates are correct.

Pruning can be done anytime during the dormant season. However, pruned vines are more susceptible to cold injury than unpruned vines so it is best to delay pruning until late winter or early spring. Delayed pruning also allows for better estimation of winter injury to buds so that adjustments in bud number can be made. On large commercial plantings pruning must be started earlier than desired to accomplish the task before spring. In these circumstances it is best to prune the hardiest cultivars first and the least hardy last. Likewise it is best to prune vines on the best sites first and the worst sites last. Often a partial pruning is done during fall and winter with the final pruning in spring.